The Sun Heats Us Up!

Theme: The sun is the source of heat on our planet. The sun is also the source of heat for the rest of the planets in our solar system.
Goal: To introduce students to the sun, our nearest star.
Curriculum Match: pre- Kindergarten – 2nd grade
Time: About 1 hour

Objective: By the end of this lesson students will be able to:

1) Identify the sun as the earth's heat source.
2) Use a thermometer.
3) Explain that it is warmer in the sun than in the shade.
4) Explain that planets that are closer to the sun are warmer than those that are far away.

Materials:

Cups
Water
Thermometers
Sets of identical objects (stuffed animals, rubber balls, crayons, metal coins, etc.)
Make sure it is a warm, sunny day!

Instructions:

Divide the students into small groups. Each group receives 2 small cups which are partially filled with water. One cup of water is placed in the sun, while the other cup is placed in the shade. It might be helpful to label the cups with "sun" and "shade". Make sure that a location is chosen where it will stay sunny or shady for a few hours. Each group can be given 2 additional objects, such as 2 rubber balls balls, 2 crayons, 2 stuffed animals, 2 pennies, etc. One of these objects should be placed in the sun while the other is placed in the shade.

Leave the objects outside for a few hours. When the students return outside, they will be asked to make a series of physical observations.

1. Can they feel a difference on their skin between the sun and the shade?
2. Touch the object that was in the sun and the identical object that was in the shade. Do they feel any different? Is one warmer than the other?
3. Use the thermometer to measure the temperature of the water in each cup. Is there a difference in temperature?
4. Would we feel more heat if we were closer to the sun or farther away from it?

5. Do the other planets in the solar system receive just as much heat as earth, or do some receive more and some receive less?
6. Show a diagram of the nine planets and their distance from the sun. Give examples of specific planets and ask students if they think that planet would be very hot or very cold.

Discussion Topics: The sun does not only give us light, it also gives us heat. The sun can be compared to a large fire or a very large light bulb. We feel more heat when we are close to the fire than when we are far away. The closer we are to the sun and the more direct the light, the more heat we feel. The earth is tilted on its axis, so when the northern hemisphere is tilted towards the sun, it is summer. When the northern hemisphere is tilted away from the sun, it is winter. Distance from the sun also affects the climates of the other planets in our solar system. Mercury is the closest planet to the sun, however one side of Mercury always faces the sun and one side always faces away from the sun. Therefore, one side of Mercury is very hot while the other side is cooler. Venus is the hottest planet overall. Venus is very similar to the Earth, only slightly closer to the sun. However, greenhouse gasses on Venus trap in the heat, making the average temperature about 850° Fahrenheit. Pluto (the farthest planet from the sun) is very cold. Pluto only receives 1/1000th the amount of light that Earth receives, and on average Pluto is about -380° Fahrenheit.